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10/780,696

02/19/2004

Hiroyuki Yoda

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23117 7590 10/20/2008  
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EXAMINER

BERDICHEVSKY, MIRIAM

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/780,696	<b>Applicant(s)</b> YODA ET AL.	
	<b>Examiner</b> MIRIAM BERDICHEVSKY	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on RCE 8/22/2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/22/2008 has been entered.

### ***Remarks***

Claims 1 and 11 are amended. Claims 1-16 are currently pending. The Examiner apologizes for the inconsistency regarding the Yoda reference, the online translation was submitted and is of record as of 8/6/2008. In addition the IDS's have been considered.

### ***Specification***

2. The disclosure is objected to because of the following informalities: It is the Examiner's opinion that the word "whether" on line 20 of page 2 of the specification should be "weather".

Appropriate correction is required.

### ***Claim Objections***

3. Claim 3 is objected to because of the following informalities: It is the Examiner's opinion that PET is misspelled and should read "polyethylene terephthalate".

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7-14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoda (JP2003026455 see translation in file wrapper).

With respect to claim 1, Yoda discloses in Figure 2 and 4 a photovoltaic module subassembly comprising: a plurality of photovoltaic cells (1) arranged in an array (11) and electrically interconnected (9) as shown in Figure 4; according to Figure 2, a translucent, first substantially rigid plate member (5 and 4) of resin adjacent to a light receiving surface of the plurality of photovoltaic cells (11); a second substantially rigid plate member (5) of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells (11) ; and a translucent filler layer (4) located between the first and second substantially rigid plate members (5) of resin to seal the plurality of photovoltaic cells (11) (paragraph 38).

In regard to claims 2, 3, and 4, Yoda discloses the subassembly of claim 1 above, and further discloses the first plate member (5 and 4) of resin is a translucent stack of a film containing resin film containing polyethylene terephthalate (PET) of a fluorine system as a source material (paragraph 38).

In regard to claim 7, Yoda discloses the subassembly of claim 1 above (Figure 3), wherein the filler layer (4) contains as a source material such as a resin selected from the group consisting of poly vinyl butyral (PVB) resin (paragraph 21).

With respect to claim 8, Yoda discloses the subassembly of claim 1 above, wherein the plurality of photovoltaic cells (11) is sealed in the filler layer (4) as the cells undergo a lamination process employing a pouching lamination apparatus (paragraph 26, 27 & 28).

In regard to claim 9, Yoda discloses the subassembly of claim 1 above, wherein the plurality of photovoltaic cells (11) each have a light receiving surface unbonded to the filler layer (4) (paragraph 27 & 28).

With respect to claim 10, Yoda discloses the subassembly of claim 1 above (Figure 4), wherein a conductive wire electrically connecting (9) the plurality of photovoltaic cells (11) and also allowing an external, electrical output (9) is provided in the filler layer (4) and the filler layer (4) has an end provided with an output terminal electrically connected (9) to the conductive wire (paragraph 48 & 49).

In regard to claim 11, Yoda discloses a photovoltaic module with sealed insulating glass comprising as shown in Figure 2: a first plate of glass (21); a second plate of glass (22) arranged opposite the first plate of glass (21); a spacer member (23) forming a space between the first and second plates of glass (21,22); and a photovoltaic module subassembly (11) arranged in the space formed by the spacer member (23), the subassembly including a plurality of photovoltaic cells (11) arranged in an array and electrically interconnected (9) as shown in Figure 4, a translucent, first substantially rigid

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plate member (5 and 4) of resin adjacent to a light receiving surface of the plurality of photovoltaic cells (11), a second substantially rigid plate member (5) of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells (11), a translucent filler layer (4) located between the first and second substantially rigid plate members (5) of resin to seal the plurality of photovoltaic cells (11), and wherein the subassembly is not adhered to the first plate of glass or the second plate of glass (Figure 1 or Figure 2).

With respect to claim 12, Yoda discloses the module of claim 11 above as shown in Figure 2, wherein the subassembly is arranged to cooperate with at least one of the first (21) and second (22) plates of glass to form an air layer/fixed space between the subassembly (11) and the at least one of the first (21) and second (22) plate of glass (paragraph 43 & 52).

In regard to claim 13, Yoda discloses the module of claim 11 above as shown in Figure 2, wherein the spacer member has butyl rubber attached thereto and the spacer member (23) is fitted between the first (21) and second (22) plates of glass at their respective ends to pose the butyl rubber (31) between the spacer member (23) and the first (21) and second (22) plates of glass and silicone resin is applied and allowed to set outer than the spacer member (23) between the first (21) and second (22) plates' respective ends to allow the space to be watertight/waterproof (paragraph 43).

With respect to claim 14, Yoda discloses the module of claim 11 above, wherein the subassembly is detachably attached to a frame (2) formed of the first (21) and second (22) plates of glass and the spacer member (23) (Figure 3).

With respect to claim 16, Yoda discloses the module of claim 11 above, wherein the first (21) and second (22) plates of glass are of different types or a single type selected from the group consisting of tempered glass, and wired glass (paragraph 13 & 23).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoda as applied to claim 1, in view of Yaba et al. (5,059,254 as cited in the IDS).

With respect to claim 5, Yoda discloses the subassembly of a photovoltaic module according to claim 4 above, but fails to disclose wherein at least one of the first and second plate members/interlayer (5) of resin is colored and transparent.

Yaba et al. discloses a photovoltaic module (Figure 5) with a colored polyvinyl butyral layer (4) and further teaches that it is preferable that interlayer is a colored polyvinyl butyral and transmits the visible light in ranges from 5 to 60% (col.7; lines: 40-43). Yaba et al. further teaches that if the light transmittance is higher than 60% it is difficult to reduce the glare from the back electrode and/or grid electrode of a solar cell, and if the transmittance is less than 5% then the visibility is greatly reduced (col.7; lines: 42-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the colored polyvinyl butyral resin interlayer of Yaba et al. to the subassembly of the photovoltaic device of Yoda in order to achieve from 5-60% visible light transmittance otherwise if the transmittance is higher than 60% it may be difficult to reduce the glare from the back electrode of the solar cell/photovoltaic module and if the transmittance is less than 5% then the visibility is greatly reduced.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoda as applied to claim 1, in view of Ichinose (US 5681402).

Applicant is directed to the above paragraphs for a complete discussion of Yoda.

With respect to claim 6, Yoda is silent to the subassembly of claim 4 above, wherein at least one of the first and second plate members of resin is an ultraviolet absorber.

Ichinose teaches the use well known UV absorbers in EVA and fluoro-resin systems for protection of solar cells (col. 25, lines 26-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the UV absorber of Ichinose in the resin system of Yoda because UV absorbers improve the weatherability of the resin, as taught by Ichinose (col. 25, lines 26-50).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoda as applied to claim 11, in view of Sakaitani (JP2001262782 see attached online translation).

Applicant is directed to the above paragraphs for a complete discussion of Yoda.



In regard to claim 15, Yoda is silent to the module of claim 14 above wherein the spacer member is provided with a guide rail slidably holding the subassembly to detachably attach to the frame.

Sakaitani teaches spacer member is provided with a guide rail slidably holding a subassembly to detachably attach to a frame (Figure 1, paragraph 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the sliding attachment mechanism of Sakaitani in Yoda in order to easily replace defective solar cells, as taught by Sakaitani (paragraph 3, 15 & 17).

10. Claims 1-4 and 7-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakaitani in view of Yoda.

With respect to claim 1, Sakaitani discloses in Figure 1 a photovoltaic module subassembly comprising: a plurality of photovoltaic cells (11) which comprises sandwiching of cells in weatherproofing materials such as glass and PVB and EVA (paragraph 8) and slides into a frame assembly (20). However, Sakaitani is silent to the cells being formed in an array which is electrically interconnected, having a translucent, first substantially rigid plate member of resin adjacent to a light receiving surface of the plurality of photovoltaic cells; a second substantially rigid plate member of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells; and a translucent filler layer located between the first and second substantially rigid plate members of resin to seal the plurality of photovoltaic cells.

Yoda teaches a framework which fully encapsulates the subassembly so as to provide an array (11) and electrically interconnected (9) as shown in Figure 4;

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according to Figure 2, a translucent, first substantially rigid plate member (5 and 4) of resin adjacent to a light receiving surface of the plurality of photovoltaic cells (11); a second substantially rigid plate member (5) of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells (11) ; and a translucent filler layer (4) located between the first and second substantially rigid plate members (5) of resin to seal the plurality of photovoltaic cells (11) (paragraph 38).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fully encapsulating transparent frame of Yoda in Sakaitani because the full encapsulation provides protection for the subassembly from weatherability. Moreover, the use of transparent materials as done by Yoda enables the module to be used as a skylight allowing natural light into residential spaces, as taught by Yoda (paragraph 13).

In regard to claims 2, 3, and 4, modified Sakaitani discloses the subassembly of claim 1 above, and further discloses the first plate member (5 and 4) of resin is a translucent stack of a film containing resin film containing polyethylene terephthalate (PET) of a fluorine system as a source material (Yoda: paragraph 38).

In regard to claim 7, modified Sakaitani discloses the subassembly of claim 1 above (Figure 3), wherein the filler layer (4) contains as a source material such as a resin selected from the group consisting of poly vinyl butyral (PVB) resin (Yoda: paragraph 21).

With respect to claim 8, modified Sakaitani discloses the subassembly of claim 1 above, wherein the plurality of photovoltaic cells (11) is sealed in the filler layer (4) as

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the cells undergo a lamination process employing a pouching lamination apparatus (Yoda: paragraph 26, 27 & 28).

In regard to claim 9, modified Sakaitani discloses the subassembly of claim 1 above, wherein the plurality of photovoltaic cells (11) each have a light receiving surface unbonded to the filler layer (4) (Yoda: paragraph 27 & 28).

With respect to claim 10, modified Sakaitani discloses the subassembly of claim 1 above (Figure 4), wherein a conductive wire electrically connecting (9) the plurality of photovoltaic cells (11) and also allowing an external, electrical output (9) is provided in the filler layer (4) and the filler layer (4) has an end provided with an output terminal electrically connected (9) to the conductive wire (Yoda: paragraph 48 & 49).

In regard to claim 11, With respect to claim 1, Sakaitani discloses in Figure 1 a photovoltaic module subassembly comprising: a plurality of photovoltaic cells (11) which comprises sandwiching of cells in weatherproofing materials such as glass and PVB and EVA (paragraph 8) and slides into a frame assembly (20). However, Sakaitani is silent to sealed insulating glass comprising a first plate of glass; a second plate of glass arranged opposite the first plate of glass; a spacer member forming a space between the first and second plates of glass; and a photovoltaic module subassembly arranged in the space formed by the spacer member, the subassembly including a plurality of photovoltaic cells arranged in an array and electrically interconnected, a translucent, first substantially rigid plate member of resin adjacent to a light receiving surface of the plurality of photovoltaic cells, a second substantially rigid plate member of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells, a

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translucent filler layer located between the first and second substantially rigid plate members of resin to seal the plurality of photovoltaic cells, and wherein the subassembly is not adhered to the first plate of glass or the second plate of glass.

Yoda discloses a photovoltaic module with sealed insulating glass comprising as shown in Figure 2: a first plate of glass (21); a second plate of glass (22) arranged opposite the first plate of glass (21); a spacer member (23) forming a space between the first and second plates of glass (21,22); and a photovoltaic module subassembly (11) arranged in the space formed by the spacer member (23), the subassembly including a plurality of photovoltaic cells (11) arranged in an array and electrically interconnected (9) as shown in Figure 4, a translucent, first substantially rigid plate member (5 and 4) of resin adjacent to a light receiving surface of the plurality of photovoltaic cells (11), a second substantially rigid plate member (5) of resin adjacent to a non-light receiving surface of the plurality of photovoltaic cells (11), a translucent filler layer (4) located between the first and second substantially rigid plate members (5) of resin to seal the plurality of photovoltaic cells (11), and wherein the subassembly is not adhered to the first plate of glass or the second plate of glass (Figure 1 or Figure 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the fully encapsulating transparent frame of Yoda in Sakaitani because the full encapsulation provides protection for the subassembly from weatherability. Moreover, the use of transparent materials as done by Yoda enables the module to be used as a skylight allowing natural light into residential spaces, as taught by Yoda (paragraph 13).

With respect to claim 12, modified Sakaitani discloses the module of claim 11 above as shown in Figure 2, wherein the subassembly is arranged to cooperate with at least one of the first (21) and second (22) plates of glass to form an air layer/fixed space between the subassembly (11) and the at least one of the first (21) and second (22) plate of glass (Yoda: paragraph 43 & 52).

In regard to claim 13, modified Sakaitani discloses the module of claim 11 above as shown in Figure 2, wherein the spacer member has butyl rubber attached thereto and the spacer member (23) is fitted between the first (21) and second (22) plates of glass at their respective ends to pose the butyl rubber (31) between the spacer member (23) and the first (21) and second (22) plates of glass and silicone resin is applied and allowed to set outer than the spacer member (23) between the first (21) and second (22) plates' respective ends to allow the space to be watertight/waterproof (Yoda: paragraph 43).

With respect to claim 14, modified Sakaitani discloses the module of claim 11 above, wherein the subassembly is detachably attached to a frame (2) formed of the first (21) and second (22) plates of glass and the spacer member (23) (Yoda: Figure 3).

In regard to claim 15, Sakaitani teaches wherein the spacer member is provided with a guide rail slidably holding the subassembly to detachably attach to the frame (Figure 1, paragraph 5).

With respect to claim 16, modified Sakaitani discloses the module of claim 11 above, wherein the first (21) and second (22) plates of glass are of different types or a

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single type selected from the group consisting of tempered glass, and wired glass (Yoda: paragraph 13 & 23).

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakaitani and Yoda as applied to claim 1, and further in view of Yaba et al. (5,059,254 as cited in the IDS).

Applicant is directed to the above paragraphs for a complete discussion of Sakaitani and Yoda.

With respect to claim 5, Yoda discloses the subassembly of a photovoltaic module according to claim 4 above, but fails to disclose wherein at least one of the first and second plate members/interlayer (5) of resin is colored and transparent.

Yaba et al. discloses a photovoltaic module (Figure 5) with a colored polyvinyl butyral layer (4) and further teaches that it is preferable that interlayer is a colored polyvinyl butyral and transmits the visible light in ranges from 5 to 60% (col.7; lines: 40-43). Yaba et al. further teaches that if the light transmittance is higher than 60% it is difficult to reduce the glare from the back electrode and/or grid electrode of a solar cell, and if the transmittance is less than 5% then the visibility is greatly reduced (col.7; lines: 42-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the colored polyvinyl butyral resin interlayer of Yaba et al. to the subassembly of the photovoltaic device of Yoda in order to achieve from 5-60% visible light transmittance otherwise if the transmittance is higher than 60% it may be difficult to

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reduce the glare from the back electrode of the solar cell/photovoltaic module and if the transmittance is less than 5% then the visibility is greatly reduced.

12. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakaitani and Yoda as applied to claim 1, in view of Ichinose (US 5681402).

Applicant is directed to the above paragraphs for a complete discussion of Sakaitani and Yoda.

With respect to claim 6, modified Sakaitani is silent to the subassembly of claim 4 above, wherein at least one of the first and second plate members of resin is an ultraviolet absorber.

Ichinose teaches the use well known UV absorbers in EVA and fluoro-resin systems for protection of solar cells (col. 25, lines 26-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the UV absorber of Ichinose in the resin system of Sakaitani and Yoda because UV absorbers improve the weatherability of the resin, as taught by Ichinose (col. 25, lines 26-50).

### ***Response to Arguments***

6. Applicant's arguments filed 7/25/2008 have been fully considered but they are not persuasive. Applicant argues that "substantially rigid plate" differs from Yoda's (JP2003026455) films because the instant claim's "plate" is thicker than the film of Yoda. The thickness of the plate is not claimed and thus Applicant's arguments are not commensurate with the scope of the claims. Applicant's argument that film and plate

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are different is not persuasive because Applicant claims (claim 2) that the first plate is indeed a film.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MIRIAM BERDICHEVSKY** whose telephone number is (571)270-5256. The examiner can normally be reached on M-Th, 7:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./  
Examiner, Art Unit 1795

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795